THE USE OF APPLICATIONS ON MOBILE DEVICES - MHEALTH - FOR HEALTH CARE IN THE AREA OF UROLOGY, A BIBLIOGRAPHIC REVIEW

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Isabel Rodrigues Polonio[1], Caiã Cabral Fraga Carvalho[2], Renato Santos de Oliveira Filho[3] and Heitor Carvalho Gomes[4].

ABSTRACT

The use of apps as tools in the healthcare industry has grown significantly, bringing both challenges and opportunities for the advancement of technology in patient care. This technological innovation, known as "mHealth," encompasses the use of mobile apps and other digital tools to support patient diagnosis, treatment, and monitoring, as well as serve as a valuable source of health-related information. In the field of Urology, although mHealth is still in its early stages, these tools demonstrate immense potential to revolutionize medical care.

This study highlights the importance of analyzing the feasibility, reliability, and applicability of mobile applications specifically for urologic practice. By addressing benefits, such as improved access to health services and increased adherence to treatments, and challenges, such as regulatory and data privacy issues, the work seeks to bring technological advances closer to their practical application.

This review provides theoretical insights and practical guidance, promoting innovation and assisting healthcare professionals and developers in creating more effective and safer solutions for urological care.

Keywords: mHealth. Health. Telemedicine. Applications. Apps. Urology.

[1] Medical Student, Paulista School of Medicine – UNIFESP
[2] Resident in Urology at the Faculty of Medicine of São José do Rio Preto (FAMERP)
[3] Oncological Surgeon, Professor of the Professional Master's Program in Science, Technology and Management Applied to Tissue Regeneration
[4] Professor of the Professional Master's Program in Science, Technology and Management Applied to Tissue Regeneration

INTRODUCTION

mHealth (mobile health), a type of "distance medicine", is becoming increasingly common, especially with the development and evolution of digital technologies added to their strong popularization during the COVID-19 pandemic, as a result of the necessary social isolation. In this context, medicine has adapted to the digital environment, with the challenge of maintaining the same quality of care as face-to-face consultations.

The use of applications on cell phones and mobile devices for health maintenance has grown significantly and stood out in several medical areas. However, in Urology, the application of mHealth is still little explored, despite its great potential to improve the diagnosis, follow-up, and treatment of patients. This gap highlights the need for a deeper analysis of the impact, limitations, and possibilities of using apps in this specific field.

This research is justified by the growing relevance of mobile technologies in medical practice and the need to improve health care in specialties such as Urology, where traditional methods often have limitations. In addition, understanding the impact and possibilities of mHealth is essential to guide health professionals in the use of technological tools that can increase the accessibility, efficiency, and personalization of medical care.

From a theoretical point of view, this work contributes to consolidating the available knowledge on the use of applications in Urology, identifying their potentialities and challenges, as well as evaluation criteria for these tools. Practically, the results can help professionals and developers in the improvement and conscious use of applications, promoting the development of more effective and safer technologies for urological health care.

In this way, the research intends to provide a solid foundation for future initiatives in the area, underscoring the role of mHealth as a promising and accessible resource for doctors and patients.

METHODS

We analyzed 15 articles published in the last ten years (2014-2024), which involved the use of applications for health care in the area of Urology. The articles were selected from the PubMed and VHL (Virtual Health Library) databases, using the following descriptors: "urology", "mobile app" and "patient" in PubMed, and "urology" and "mobile applications" in the VHL. In addition, articles written in Portuguese and English were searched. In this first stage, 142 articles were found in the PubMed database, and 40 articles in the VHL. From these, articles involving the use of apps for patients with urological disorders were selected, reaching 47 articles in PubMed, and 10 articles in the VHL. Among

these, studies that brought apps aimed only at health professionals were excluded. Subsequently, articles that included nephrological problems (such as kidney stones or kidney transplants) and those that were not freely available were excluded. In addition, repeated articles in both databases were disregarded in one of them.

After this selection, the results of 12 articles in PubMed and 3 articles in the VHL were reached, with a total of 15 articles reviewed. All fifteen of these articles were read in full for this review, in addition to the support of other articles that corroborated the holistic understanding of the subject addressed.

RESULTS

The reviewed articles brought several considerations about the use of mobile applications in the area of urology for the maintenance and care of patients. The conclusion obtained from the analysis can be divided into: positive points, negative points, possible solutions to the negative points, interface of the apps, comparison with traditional methods, criteria and general forms of evaluation of the apps, and general conclusions.

First, as positive points, the reduction of barriers to access and search for health services (temporal, geographical, economic, social) stands out. With the use of apps, the patient does not need to travel long distances for long periods to access health services, in addition to circumventing social impediments to seeking medical help (for example; according to one of the articles reviewed, only 1⁄3 of patients with urinary incontinence seek treatment - due to shame, lack of knowledge or difficulty of access - which could be solved by the use of mobile applications), which also generates more comfort and reduces patient expenses. In addition, mHealth provides a source of education for patients to better understand their health and disease process, including them more actively in decisions about their health, which also increases adherence to treatment. In addition, an effective communication channel is created between the doctor and the patient, resulting in more accurate monitoring and a clearer visualization of the evolution of the patient's condition, in addition to reducing the need for hospital visits. In this way, the definition of patients' expectations and needs is better established, generating a personalization of medicine for each patient, which creates a much more targeted and effective service. Finally, the regulated use of mHealth facilitates the general monitoring of public health, being able to generate reliable and useful data for the development of scientific research, in addition to creating a connection between primary and secondary care in an organized and accurate way.

Secondly, as negative points, the plausible difficulty of the patient in dealing with the app is initially highlighted, due to the lack of familiarity and trust with the technology, or even due to the eventual obsolescence of the technology used, in addition to possible technical failures, resulting in low engagement and consequently low effectiveness of the method. In addition, the lack of transparency and difficulty in validating information is highlighted, generated by the lack of regulation, certification and scientific review, which results in low reliability. Finally, apps can generate a much larger amount of data than traditional methods, which can overload the health professional responsible for processing, which raises the need to develop an application that can perform reliable processing of the data collected, but that, at the same time, includes the health professional in the data organization stages.

As possible solutions to the negative points listed above, the following stand out: the participation of experts in the application development process, which would ensure the following of official guidelines and the creation of an official certification for health apps. In this way, the difficulties of reliability and veracity of information would be minimized through validation and review regulated by specialized agencies in the area.

Regarding the interfaces of the reviewed apps, some tools proved useful for the development of effective apps. Among them, the questionnaires stand out, applied to both health professionals and patients, which allows users to generate feedback on the functioning of the application, aiming at its constant evolution. In addition, the presence of artifacts such as reminders for users (time to take the medication, time since the last appointment, etc.) and alerts in cases of "red flags" was also evidenced, that is, signs of concern that urgently require a visit to a health professional. In addition, the use of visual instruments, such as graphs, images, etc., were highlighted as extremely useful for understanding the patient's progress. Finally, the importance of a design and an interface that please both the doctor and the patient is emphasized, so that the guarantee of adherence of both to the application is increased.

Some of the articles brought comparisons between traditional methods and mHealth methods. One of the most relevant comparisons was made between paper (traditional) voiding diaries and app voiding diaries. With it, it was concluded that traditional methods are more inconsistent and with less reliable data, in addition to being more difficult to interpret compared to app voiding diaries, which are much more patient-centered and allow for better information passage.

The analyzed studies showed some criteria and general ways of evaluating the apps, which are extremely relevant information for distinguishing a good and a bad app. In general, usability, feasibility and confidentiality criteria were evaluated.

Among the forms of evaluation, two stood out: the "SWOT analysis" and the "step-by-step evaluation method". The SWOT analysis is based on 4 principles: the strengths, weaknesses, opportunities, and threats that the tool may present. In this way, an overall cost-benefit overview of the app is created, which allows you to determine its quality. The "step-by-step" method, on the other hand, is based on 5 essential steps for the analysis and evaluation of an mHealth instrument, which, in short, are: collection of basic data about the app (who is the designer, what is the model), exclusion of risk, privacy and security problems (if the app has a privacy policy, what personal data is collected, whether the personal data is made available to third parties), evaluation of the evidence (checking if there is a published review or scientific evidence behind the app), analysis of how easy it is to use the app (usability) and, finally, checking interoperability (how easy it is to share data with other health software). From these evaluation tools, it was possible to select apps that are really reliable and effective for the use of patients and health professionals, ensuring greater safety for the use of these artifacts.

Therefore, it is concluded that the growing use of mHealth in medicine can be of great value to the field of Urology, especially for conditions of constant monitoring, such as the monitoring of chronic diseases and the use of voiding diaries, for example.

Thus, although still little used in this area, mobile device applications are a way to improve care and quality of health care for urological patients, and must have appropriate investment for their development in an effective, safe and supervised way.

DISCUSSION

The evolution of mHealth and its increasing use in medicine raises questions about its safety and effectiveness, requiring better methods of inspection and evaluation, in addition to the more elaborate and specialized development of applications, which present, simultaneously, positive points and barriers to be overcome.

Apps can become much more present and effective tools in offices and specialties such as Urology have a lot to evolve in this regard, given the potential to contemplate all the growth that mHealth has shown in recent times. As it is an area with a great need for patient monitoring and with diagnostic and treatment methods that require frequent data and constant monitoring, the use of applications on mobile devices can be the solution to many urological pathologies. As a great example, we can mention the voiding diaries, widely used in the treatment of urinary dysfunctions, which affect a good portion of the population. These diaries are traditionally recorded by patients with pen and paper, which generates some problems in the interpretation and feasibility of the data. By replacing this traditional

method with the use of applications, it is possible to eliminate some of the obstacles that it presents, such as illegibility, lack of data reliability, discomfort, lack of patient adherence, and lack of practicality.

However, it is important to highlight some crucial points for the development and use of apps in a really positive and efficient way. Among them, the need for inspection stands out. Addressed earlier in this article, in the negative points, the lack of inspection and certification of apps is one of the main factors that hinder the adherence of doctors and patients, in addition to harming the effectiveness of apps, and even generating false and erroneous information for patients. Thus, one of the key points for the positive growth of mHealth is validation and proper regulation. Secondly, the importance of application design is emphasized, which must involve users and increase adherence through artifacts that encourage correct use, such as graphic tools, images, reminders, among others. In addition, another crucial point is the possibility of transferring data from the app to the health professional, who must be able to monitor the entire collection and analysis process. Finally, it is highlighted that good software for the processing and intelligent sharing of data is essential for the functioning of the mHealth method, allowing the optimization of data collection and easier interpretation by the health professional.

Therefore, the use of mobile applications for health care in the area of Urology has enormous potential, which can be explored by health professionals and patients respecting the conditions and main points exposed in this article, and in this way, it will generate an improvement in the quality of care and care in urological health and will allow a technological evolution in the area of Urology.

From this review, it is assumed that the process of developing and applying an app for urological health care is better understood. Thus, the results of this research aim to collaborate with future health professionals and specialists who are in this current context of technological evolution and growth of mHealth, guiding them along a more efficient path for their adaptation and assisting them in the process of patient care. In addition, it is expected to help patients submitted to the aforementioned methods, allowing them to better understand the functioning of the doctor-patient relationship at a distance, and increasing their trust and adherence to health servers and services.

Finally, it is noteworthy that this study has limitations in the number of articles and apps reviewed and it is recommended that future research be able to find a greater number of materials on the subject, allowing an even greater and deeper understanding of the impacts and perspectives on mHealth in the area of Urology.

CONCLUSION

This article reinforces the importance of the use of mobile technologies in the health area, with emphasis on mHealth as a promising tool in urological care. Although it is still an underexplored practice in Urology, the implementation of mobile applications can offer numerous benefits, such as greater accessibility, treatment adherence, patient education, personalization of care, and accurate collection of clinical data.

However, the analysis also revealed significant challenges, such as a lack of regulation, scientific validation, and barriers related to usability and data overload for healthcare professionals. These challenges highlight the need for initiatives that ensure the reliability and security of information, such as official certifications, the participation of experts in the development of applications, and improvements in design and interfaces.

mHealth has the potential to transform medical practice in Urology, especially in the monitoring of chronic conditions and the use of tools such as digital voiding diaries. For this potential to be fully achieved, it is essential to invest in research, regulation, and development of technologies aligned with the needs of patients and professionals in the area.

This study contributes to the understanding of the impact and possibilities of mHealth in Urology and serves as a basis for future investigations. It is expected that, with the continued development and effective application of these tools, medical practice in this specialty will evolve, resulting in more accessible, safe, and efficient care for urological patients.

Finally, it is noteworthy that despite presenting a comprehensive analysis, this study has some limitations that should be considered. The reduced number of articles reviewed may restrict the generalizability of the results, as well as the exclusive focus on free and publicly accessible applications, excluding paid or in-development tools. In addition, the research was based only on literature, without conducting practical tests that validated the effectiveness of the apps in real clinical scenarios. There was also a restriction to Portuguese and English, which may have left out relevant studies in other languages. Finally, the diversity of methodologies used in the articles analyzed made it difficult to directly compare the results, and the exclusion of applications aimed exclusively at health professionals or nephrological conditions limited the scope of the review. These factors underscore the need for broader and more practical future research to delve deeper into the topic.

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